

# **DEEPWATER CAPABILITIES PROJECT**

## **MISSION NEED STATEMENT**

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**Submitted by:**

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**Endorsed:**

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**Vice Commandant**

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## **MISSION NEED STATEMENT FOR THE DEEPWATER CAPABILITIES PROJECT**

### ***STEAMING AHEAD INTO THE TWENTY-FIRST CENTURY***

Introduction. Since 1790 the U.S. Coast Guard has maintained a high seas capability which represents the very essence of the Service. All Coast Guard roles--Maritime Law Enforcement, Maritime Safety, National Defense, and Marine Environmental Protection--are performed in the Deepwater arena, which is defined as that area beyond the normal operating range of single-crewed shore-based small boats, where either extended on scene presence, long transit distances, or forward deployment is required to perform the mission.

Today's newspapers document Coast Guard service throughout the global maritime regions. Coast Guard forces are conducting nation building activities in the Mediterranean Sea; mariners rely on our tracking of icebergs in the North Atlantic; marine resources are protected from the Northwest Atlantic fishing grounds to the far reaches of the Pacific; our polar icebreakers ply the icecaps to further scientific discovery while contributing to the national security; and we are combating illicit drug trafficking in two oceans, from the source countries to the shores of the U.S. The Coast Guard's mandate to pursue offshore missions, far from shoreside support, remains clear. This pursuit requires sophisticated capabilities in order to perform safely and efficiently. The Coast Guard's outstanding performance in the Deepwater environment is in jeopardy, however, because almost all of our major assets which pursue these crucial missions are rapidly approaching the end of their useful service lives.

The Coast Guard's ability to prosecute missions effectively falls short in two primary areas: resource capabilities and resource availability. Our assets do not have the capabilities to perform as efficiently as they should. When compared with functional requirements generated for each mission, the capabilities of our present assets show their age. Of greater concern is the undeniable fact that as assets reach the end of their service lives, the Coast Guard will not have the platforms necessary to meet future employment needs.

The *Deepwater Mission Analysis Report* underscores the importance of maintaining our core capabilities into the Twenty-first Century. It is imperative that the Coast Guard continue its alignment with national priorities by developing innovative resource allocation and asset mixes, leveraging technologies, and establishing new performance standards and measures. This commitment to achieve economical and environmentally sound policies while attaining high public service standards are cornerstones in our goal of maintaining the Coast Guard as the world's premier maritime service.

# 1. Description of the Mission.

## a. Required Missions.

The U.S. Coast Guard is a key element in supporting the National Security Strategy by maintaining the nation's economic, social, environmental, and military security in the maritime environment. One of the nation's five military Services, the Coast Guard is characterized by a unique combination of disciplines which extend far beyond traditional military roles. The Coast Guard is not merely a small navy, duplicating the efforts of others, but is a sensible complement to the other Services, offering expertise developed from our peacetime operations which is available nowhere else.

This complex organization of people, ships, aircraft, boats, and shore stations is tasked with the following primary roles in support of the National Security Strategy:

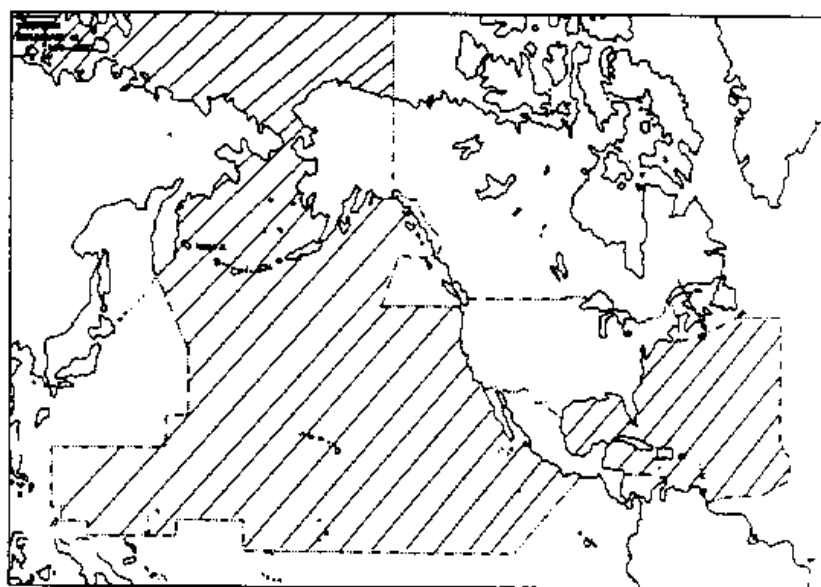
***MARITIME LAW ENFORCEMENT-*** *Promote national well-being, security, and economic prosperity by enforcing national and international laws and treaties throughout the maritime region.*

The Coast Guard, as the nations lead maritime law enforcement agency, has broad, multifaceted jurisdictional authority. The current Maritime Law Enforcement (MLE) emphasis is on:

(1) combating illicit drug trafficking, (2) interdicting illegal migrants at sea, and (3) protecting fisheries and other living marine resources. Additionally, the Coast Guard is responsible to enforce all federal laws at sea, and other responsibilities include preventing smuggling of other contraband such as firearms and currency, ensuring compliance with vessel safety laws, responding to vessel incidents involving violent acts or other criminal activity, and providing support to other federal, state and local law enforcement agencies.

***MARITIME SAFETY*** - *Facilitate safe, effective marine transportation and promote the maritime public's well-being and economic prosperity by minimizing injury, death, and property damage on, over, and under the high seas and waters subject to the jurisdiction of the United States.*

The Coast Guard is responsible for conducting search and rescue (SAR) throughout the Maritime SAR Area, a massive region which includes all waters subject to the jurisdiction of the United States, and high seas areas covering much of the North Atlantic and Pacific Oceans, as well as a substantial portion of the Arctic Ocean as depicted in Figure 1. In addition, maritime tradition and international law require Coast Guard assets to respond to distress requests for assistance in any area that they are operating in, regardless of location. While SAR operations represent but a small percentage of Deepwater operations, the Coast Guard must retain its position as the world's leader in this vital humanitarian mission.



Maritime SAR Region

Since 1914 the Coast Guard has been responsible for the management and operation of the International Ice Patrol (IIP), an international effort to warn mariners of the presence of icebergs in the vicinity of major shipping lanes, as shown in Figure 2. Even in the modern age, icebergs remain a very real hazard to shipping, however, since the IIP began, no loss of life or vessels has occurred with its are of responsibility.

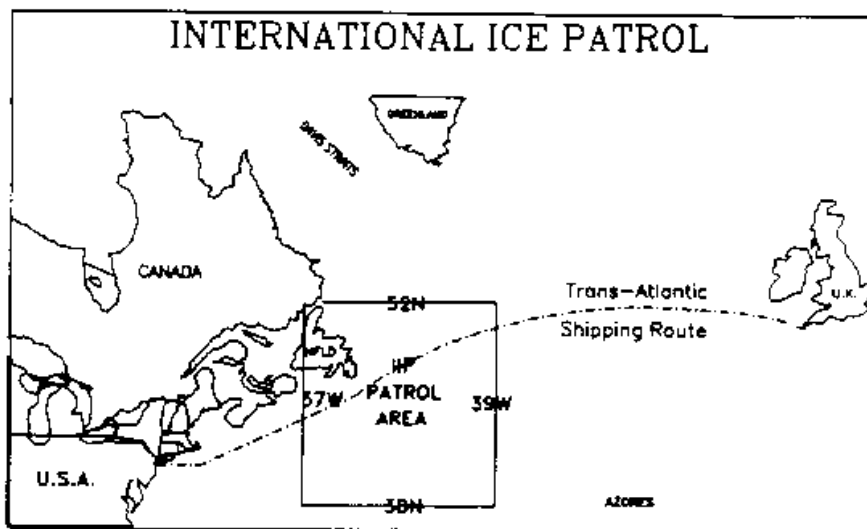


Figure 1-2

The Coast Guard supports the National Oceanic and Atmospheric Administration (NOAA) in establishing and maintaining a system of offshore environmental data collection buoys which enhance the National Weather Service's weather forecasting ability. Since the buoy system was first established, the Coast Guard has provided this support to the National Data Buoy Center (NDBC) in the form of deployment, maintenance, and recovery of NDBC's offshore buoys.

***NATIONAL DEFENSE*** - *Support the National Military Strategy by engaging in domestic and international efforts that enhance the image of the United States, protect our economic interests, and defend U.S. citizens and property.*

The Coast Guard is, by statute, "a military service and a branch of the Armed Forces of the United States at all times" (14 USC 1). The Coast Guard has participated in every war or national contingency since our nation was founded. The Coast Guard offers the nation a defense bargain as our assets, while sometimes less capable, are far less expensive than Navy platforms, and are fully employed during peacetime, thus "earning their keep" while waiting to respond.

Although the Coast Guard performs a variety of defense taskings, our core competencies at present include:

**Maritime Interception Operations (MIO)**, a naval mission conducted to enforce the seaward portion of certain sanctions against other nations or group of nations including surveillance of approach zones, querying and/or stopping inbound vessels, boarding and searching them to ensure compliance with applicable international rules and UN resolutions, and diverting or redirecting those vessels not in compliance;

**Deployed Port Operations, Security and Defense (DPOSD)**, a national defense mission conducted to ensure militarily critical port and harbor areas in or near the theater of operations are maintained free of hostile threats, terrorist actions and safety deficiencies which would be a threat to support and re-supply operations; and

**Environmental Defense Operations**, a mission yet to be fully developed, where Coast Guard forces will assist in responding to minimize operational interference and environmental damage caused by deliberate enemy actions such as the Iraqi-generated crude oil spill during Operation DESERT SHIELD/STORM.

**MARINE ENVIRONMENTAL PROTECTION** - *Protect the marine environment and preserve our natural resources while promoting national well-being and economic prosperity.*

The Coast Guard is responsible for the enforcement of a number of safety and pollution prevention regulations on ships operating in U.S. waters, including foreign vessels. The Oil Pollution Act of 1990 has resulted in a considerable increase in Coast Guard responsibilities, and the International Convention for the Prevention of Pollution from Ships (MARPOL) has broadened our authority to take direct enforcement action for oil, noxious liquid, and garbage discharges offshore.

**Future Missions.** The Coast Guard is a dynamic service facing continual change. Our service began as a revenue collecting agency, and the primary roles that the Coast Guard has become known for--Maritime Law Enforcement, Maritime Safety, Marine Environmental Protection, and National Defense--evolved as the organization matured. The *Deepwater Mission Analysis Report* (MAR) points to other possible Deepwater missions for the Coast Guard of the future. Future missions could include protection of non-living marine resources, oceanographic data collection and survey, UN and international operations, and disaster and terrorism response and protection. The Center for Naval Analyses is presently conducting a study which will result in recommendations to the Chief of Naval Operations as to appropriate future national defense missions for the Coast Guard. Possibilities under consideration include a wide variety of military and diplomatic missions.

Since definite requirements for these missions do not yet exist, they are not included in this document. While it would be premature to allocate precious resources for uncertain tasking, such possibilities should be considered when required capabilities are discussed. Many of our current Deepwater resources are employed in missions which were not considered when the assets were designed. Raising these issues now serves as a "placeholder" to ensure that future Coast Guard resources will be better equipped for the responsibilities they pursue. As the probability of those missions becoming Coast Guard tasking increases, their effect on asset capabilities will be evaluated and documented.

## **b. Mission Need.**

Most Coast Guard Deepwater missions can be broken down into the functional tasks of target detection, classification or sorting into targets of interest (TOIs), specific target identification, and prosecution. In order for the Coast Guard to retain its multi-mission flexibility, a capability in unison with the Department of Transportation's goal for strategic utilization of public resources, the ability of our Deepwater assets to execute all of these basic functional tasks is essential. The functional tasks vary depending on the specific target type and the nature of the mission as outlined below.

**Drug Interdiction.** The key requirements for successful drug interdiction are surveillance and presence in areas where the possibility of contraband smuggling exists. The capability to respond to intelligence information and known incidents of drug, smuggling such as air drops or mother ship rendezvous as they occur is required for this activity. The ability to maintain a continuous on scene presence, thus providing a visible deterrence to the smuggler, and to dispatch boarding teams to conduct inspections are important mission requirements. Our law enforcement assets must have the ability to compel compliance with Coast Guard law enforcement authority.

**Alien Migration Interdiction Operations.** Proactive patrols are required to counter the normal flow of illegal migrants. These patrols require surveillance of assigned areas where suspected illegal migration may occur, and the capability to dispatch boarding teams to suspect vessels and subsequently escort these vessels depending on the final disposition of each case. Additionally, assets must respond to intelligence or operational sightings. Assets must be capable of sustained presence on scene, and must have the capability to rescue a large number of people simultaneously in the event that the typical unseaworthy or overloaded migrant craft sinks or capsizes during the attempted voyage. Ordinarily, assets must provide food and shelter to large number of people when migrants must be removed from their conveyance until final disposition.

**Living Marine Resource Enforcement.** To meet the objectives of this program, it is necessary for the Coast Guard to project a continuous enforcement presence throughout the U.S. EEZ and along its boundary, as-well as in international areas of interest to the U.S. This presence must have the capability to deter illegal or unauthorized activity by documenting violations through vessel boardings and inspections.



**General Law Enforcement.** The prosecution of this mission requires both proactive patrolling and a reactive response to intelligence information that may be received. The current scope of the operations is minor and the pro-active portion of the mission is conducted frequently as a secondary outcome of a fisheries, AMIO or counter drug patrol. The response to specific intelligence is handled on a case by case basis according to the reliability of the information and availability of an asset. As with all law enforcement missions, our assets must have the ability to compel compliance with Coast Guard law enforcement authority.

**Deepwater Search and Rescue.** The ability for assets to search for and locate distressed mariners and recover them from positions of peril; provide medical advice, assistance, or evacuation; and when necessary, provide subjects safe transport to shoreside locations are the primary requirements of the mission. As a secondary priority, Coast Guard SAR assets may attempt to recover or control damage to distressed vessels and other property. Such assistance may consist of controlling or terminating flooding, fire fighting, dewatering, providing mechanical assistance, and towing of stricken vessels.

**International Ice Patrol.** The Coast Guard is responsible to provide for ice observation and broadcast of shipping advisories whenever the presence of icebergs threaten the shipping routes. The threat typically exists from February through July, but conditions vary annually and operations commence as conditions require. The Coast Guard is responsible for those ice regions of the North Atlantic Ocean through which the major trans-Atlantic shipping tracks pass.

**Data Buoy Support.** The Coast Guard is responsible to provide for maintenance of NDBC buoys, and also establishes most new buoys and transports relieved buoys to maintenance facilities. This service is almost always conducted with NDBC technicians present. Requirements of this activity include transportation of technicians to buoys and the ability to provide maintenance and industrial support. Assets also must establish real time communications links with NDBC's data network to validate data being transmitted by the buoy. Finally transportation of replacement buoys to and from station is required.

**General Defense Operations.** The capability to perform surveillance, visit, board, search and seize (VBSS), limited unit defense under a system akin to today's developing Cooperative Engagement Capability system, and provide berthing and logistics support for additional personnel are partial requirements of this activity. Assets must be capable of operating worldwide with sustained presence in the area of responsibility. Interoperability with DOD and other friendly forces, through a system like the present Joint Tactical Information Distribution System (JTIDS/Link-16), is essential.

**Maritime Interception Operations.** Assets are required to conduct thorough surveillance of an assigned area of responsibility, detect and intercept all shipping, and dispatch trained boarding or inspection teams, providing for their logistics, support, transportation, and protection. Sustained presence in the operating area is a necessity, as is the ability to compel compliance with Coast Guard orders and instructions. Interoperability with other friendly forces is essential to the success of this mission.

**Deployed Port Operations, Security and Defense Mission.** Conduct thorough surveillance of an assigned area of operations, dispatch appropriate assets to investigate any threat to security, and respond to threats directly or indirectly. Interoperability with other friendly forces and waterside protection of port facilities are necessary capabilities, and assets must be capable of sustained presence.

**Environmental Defense Operations.** Requirements are yet to be determined, however interoperability and ability to transport crews to the scenes of environmental incidents are certain requirements. Some oil spill or containment capability will also likely be a requirement.

**MARPOL Enforcement.** To date, this new mission has been prosecuted only on an ad hoc basis. Dedicated surveillance operations employing shore based aircraft, and occasionally patrol boats, have been conducted in the Florida Straits, Gulf of Mexico, and off the California coast. Surveillance coupled with a limited surface presence seems to be the most efficient means of conducting this task.

**Lightering Zone Enforcement.** The *Oil Pollution Act of 1990* restricts oil tankers not equipped with double hulls from many U.S. ports, thus requiring such vessels to load cargo in off shore lightering zones. The basic requirement of the Coast Guard's Lightering Zone Enforcement mission is the capability to surveil lightering zones and conduct inspections as necessary. Seventy-four percent of the nation's crude oil imports were received in Gulf of Mexico ports, and twenty-nine percent of this was lightered.

**Foreign Vessel Inspection.** Surveillance of operating areas and the ability to conduct at sea inspections are the basic requirements of this mission. This mission is not currently conducted in the Deepwater environment.

Appendices A-D of the Deepwater Mission Analysis Report list the functional requirements for each existing Deepwater mission in great detail. Functional requirements delineate capabilities required to perform a mission successfully, without regard to hardware or systems. Failure to provide these capabilities in some fashion will preclude a future asset from playing a significant role in the respective mission.

c. Authority.

The statutory basis underlying Coast Guard law enforcement activity is set forth in 14 USC 2 and 14 USC 89. 14 USC 2 establishes, as a primary duty of the Coast Guard, the enforcement of "all applicable federal laws on, under, and over the high seas and waters subject to the Jurisdiction of the United States. 14 USC 89 authorizes the Coast Guard to take law enforcement actions on the high seas and waters over which the U.S. has Jurisdiction for the "prevention, detection, and suppression of violations of laws of the United States" and authorizes Coast Guard commissioned, warrant, and petty officers to board, search, detain, arrest, or seize in appropriate circumstances. In the execution of its Maritime Law Enforcement role, the Coast Guard enforces statutes which, by their terms require Coast Guard action, and others which the Coast Guard enforces primarily for some other Federal agency. A partial listing of U.S. Code Titles which include provisions enforced by the Coast Guard includes:

- Title 16 USC- Conservation
- Title 18 USC- Crimes
- Title 19 USC- U.S. Customs Authority and Duties
- Title 21 USC- Food and Drugs (abuse)
- Title 26 USC- Internal Revenue Code
- Title 31 USC- Money and Finance
- Title 33 USC- Navigation and Navigable Waters
- Title 46 USC- Shipping (Maritime Safety, Inspection)
- Title 49 USC- Transportation

The statutory mandates for the execution of missions within the Maritime Safety role are contained in 14 USC 2 and 14 USC 88. The U.S. entered into formal agreement with the other maritime nations at the International Conference on Safety of Life at Sea (SOLAS) Convention of 1915, and this treaty remains in effect with but minor changes. 46 App USC 738e authorizes the Coast Guard to administer the International Ice Observation and Ice Patrol Service.

The Coast Guard is authorized by 14 USC 141 to use its people and assets to help other federal agencies. A NOAA/USCG Memorandum of Agreement dated 27 March 1972, and Working Agreements signed 3 September 1993 document the Coast Guard's support to the National Data Buoy Center (NDBC). These Working Agreements can be terminated by either agency with a one year advance notice.

The Coast Guard is, by statute, "a military Service and a branch of the Armed Forces of the United States at all times" (14 USC 1). It is required to "maintain a state of readiness to function as a specialized service in the Navy in time of war". (14 USC 2) and to operate as a Service in the Navy when the President so directs. (14 USC 3) It is also specifically authorized to assist the Department of Defense in performance of any activity for which the Coast Guard is especially qualified

(14 USC 141). The November 1993 NAVGARD Board validated the Coast Guard's National Defense role, and the May 1994 NAVGARD Board directed a Memorandum of Agreement, which was signed on 3 October 1995, to validate Maritime Interception Operations; Deployed Port Operations, Security and Defense; and Environmental Defense Operations as Coast Guard missions.

There are numerous statutes contained in U.S. Code Titles 33 and 46 which provide the Coast Guard the authority to conduct the Marine Environmental Protection role. They include the Federal Water Pollution Control Act (Clean Water Act), the Oil Pollution Act of 1990 (OPA 90), the Port and Waterways Safety Act of 1972 (PWSA) as amended by the Port and Tanker Safety Act of 1978 (PTSA), and the Act to Prevent Pollution from Ships (APPS). The International Convention for the Prevention of Pollution from Ships (MARPOL) provides additional guidance for execution of Marine Environmental Protection missions.

## 2. Rationale for the Acquisition.

### a. Current Capability.

The Coast Guard maintains a capable, but rapidly aging, Deepwater fleet consisting of high and medium endurance cutters, patrol boats, long and medium range fixed wing aircraft, and short and medium range rotary wing aircraft. The multi-mission nature of these resources gives operational commanders the flexibility to use their assets wherever the need is greatest, and guarantees that all assets are fully employed even during those rare periods when their service in their primary mission is not required. An important element in our Deepwater fleet, which will not be discussed in this document, is our polar icebreaking fleet. These assets will not be factored into our mission need calculations since they are single mission assets which do not typically contribute to the missions discussed in this document.

High and medium endurance cutters, and patrol boats when a less robust capability is required, are utilized in all Deepwater missions, and are the platforms of choice when personnel are required on scene for extended periods of time. Their seakeeping abilities allow these larger platforms to conduct surveillance regardless of the weather, and remain on scene for extended periods of time. They are easy to spot, by friend and foe alike, and represent to all the Coast Guard's commitment to our important missions. Their crews conduct the vessel and facility boardings which are integral to effective enforcement of laws and treaties. Their command and control capabilities are essential to coordinated operations, and their limited warfighting capabilities allow them to compel compliance in law enforcement operations, as well as support the national defense. Our surface platforms respond to SAR cases, and unlike aircraft, can send assistance teams to stricken vessels and tow them when necessary.

Their size and logistics support capability allow them to embark extra personnel, be they augmentation crews, mariners in distress, or large groups of interdicted migrants.

Aviation assets are invaluable due to their speed and ability to cover large areas quickly. Fixed wing aircraft (C-130 and HU-25) routinely conduct surveillance for all Deepwater missions, often employing advanced radar or infrared systems to enhance their detection and classification ranges. The C-130 Hercules has a large cargo capacity which allows it to fly critical logistics support for deployed operations. The HU-25 Falcon aircraft, because of its speed, serves as an air intercept in deterring air drug smuggling, and its infrared systems serve well in detecting and determining the limits of marine pollution. Our helicopters fly short and medium range surveillance, and are capable of operating independently, forward deploying to remote locations, or deploying onboard WMECs and WMECs to extend cutter capabilities. Aircraft of all classes provide our quickest response to SAR cases and can drop or lower survival equipment to those in distress, while helicopters often utilize their lift capability to rescue survivors when necessary.

Most of our current Deepwater resources are reaching their end of useful service. Our 378' (115m) High Endurance cutters (WHECs), whose serviceability has already been extended through the Fleet Renovation and Modernization (FRAM) program, begin to reach the end of their service lives in 2003. The 210' (64m) Medium Endurance cutters (WMECs), which have also been renovated under the Major Maintenance Availability (MMA) program, reach the end of their service lives beginning in 2001. Even our "new" 270' (82.5m) WMECs are facing end of service life, beginning in 2012. Refer to Figure 3.

Our aircraft face similar problems. The Coast Guard's HC-130 long range aircraft reach the end of their service lives soon: 1997 for our three 1600 series airframes; 1998 for the five 1500 series airframes; and 2001 to 2007 for the twenty-two 1700 series airframes. Our HU-25 Falcon Jets will reach their end of service life in 2003, our HH-65 short range helicopters in 2004, and our HH-60 medium range helicopters in 2005 to 2010. Refer to Figure 4.

The *Deepwater Mission Analysis Report* reviewed all Deepwater missions, both current and proposed, and derived an estimate of what capabilities the Coast Guard will require to carry out these responsibilities effectively. These mission employment demands and required capabilities, referred to as Demand Projections and Functional Requirements respectively, were then compared with our present and projected assets to determine whether the Coast Guard can continue these duties without resorting to major acquisition. The analysis has indicated that the Coast Guard will continue to have Deepwater responsibilities well into the future, but will suffer two major resource shortcomings: resource availability and resource capability.

PERCENTAGE OF SURFACE  
AVAILABILITY BY CLASS

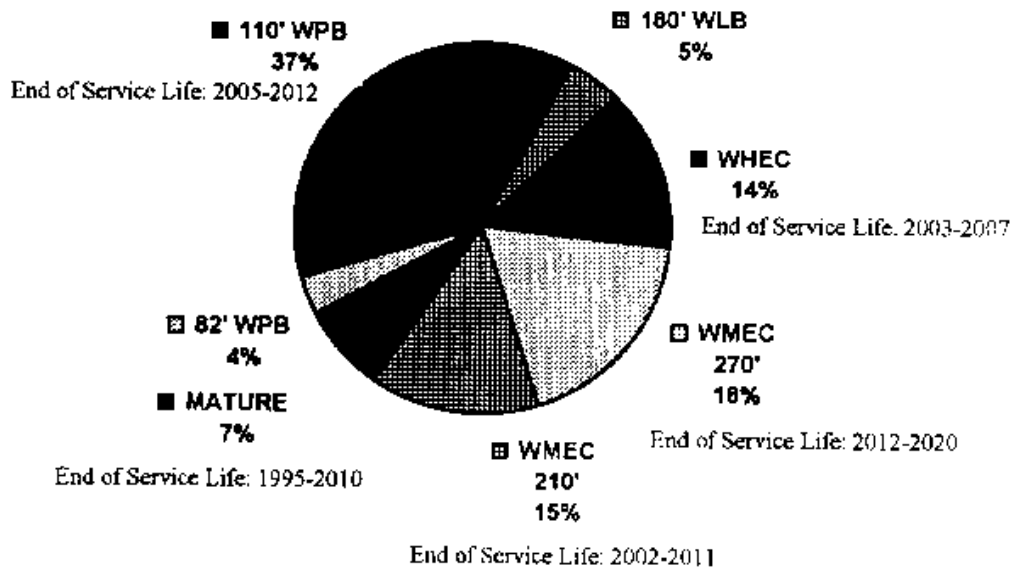


Figure 3

PERCENTAGE OF AVIATION  
AVAILABILITY BY TYPE OF AIRCRAFT

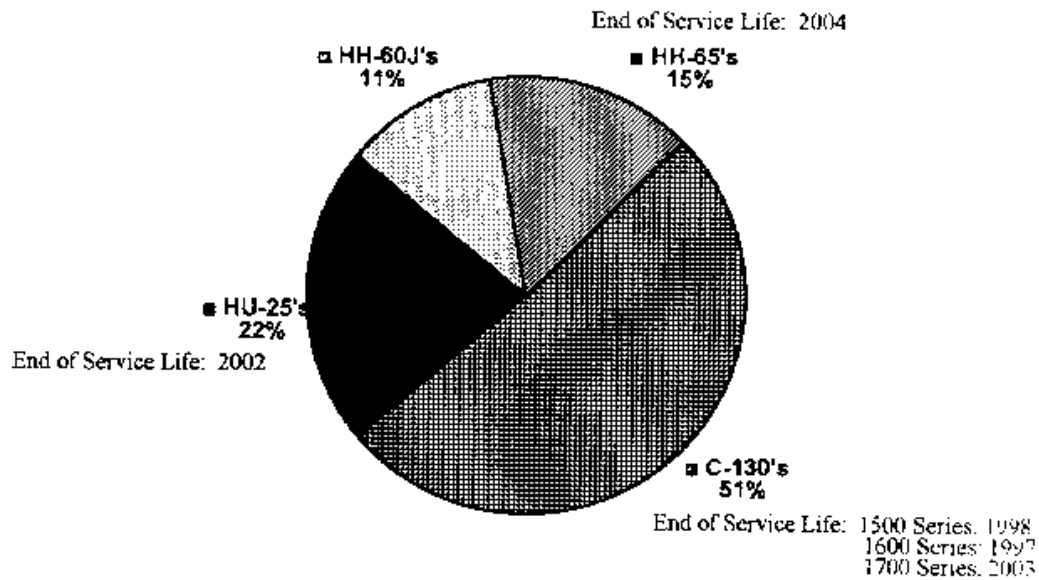


Figure 4

**Resource Availability.** Availability shortcomings exist already and will grow alarmingly to over 500K combined surface and air hours annually as our assets reach their end of service life. See Figures 5 and 6. This figure represents only routine mission demand; surge operations which have become so common in recent years cannot be estimated accurately. At first glance it may be difficult to accept that this availability shortfall exists today. Our resources appear adequate, but new missions such as MARPOL Enforcement, Lightering Zone Enforcement, and Foreign Vessel Inspection are not yet being performed by Deepwater assets. A larger portion of the availability gap stems from new law enforcement program standards which were developed to fulfill National Performance Review Act requirements. The recent implementation of these standards has made it evident that the Coast Guard does not have the capabilities or resources to achieve the necessary level of performance throughout our entire area of responsibility. Our Deepwater forces are meeting the standards in high threat areas where they concentrate effort, but fall short in lower priority areas. The Availability gap of the future is much easier to understand, however, and the need to replace fading assets is clear.

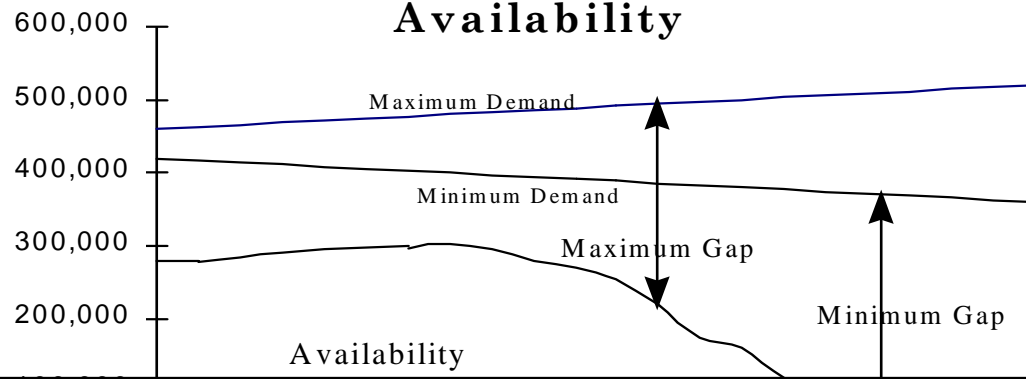
Resource Capability. Although present Coast Guard assets are fairly capable, analysis has shown that capability improvements must be made, particularly as new mission requirements are added to our workload. Increases in our command, control, communications, computers, and intelligence (C4I) capabilities; our ability to detect, classify, and identify targets; our abilities to dispatch boarding parties more efficiently; and the speed of our surface assets must be addressed. Since surveillance is such a major portion of the Coast Guard's proactive function, innovations in surveillance technologies could prove to be a force multiplier by eliminating the need for some of our more traditional assets. This notwithstanding, our missions will continue to require on scene presence, with a large passenger carrying capacity and a high level of sustainability. This points to the continued need for a number of larger surface assets. Likewise, innovative "eyes in the sky" such as satellite systems, unmanned aerial vehicles (UAV), and over the horizon radar, will likely reduce the need for some conventional aircraft, but aircraft on scene capabilities will continue to be a requirement. The need remains for some type of air assets with the capability to transport and recover personnel and supplies, and the ability to interact with other Coast Guard assets and targets on scene.

b. Planned Capability.

The Coast Guard must close the resource gaps which have been identified. Left to pursue its Deepwater responsibilities without new capital investment, the Service risks becoming but a hollow shell of its former self. The resource availability gap is particularly disturbing. Already asset availability does not

Resource Hours  
WHEC, WMEC  
WPB

## Cutter Demand vs Availability



## Aviation Asset Demand vs Availability

Available  
Flight Hours

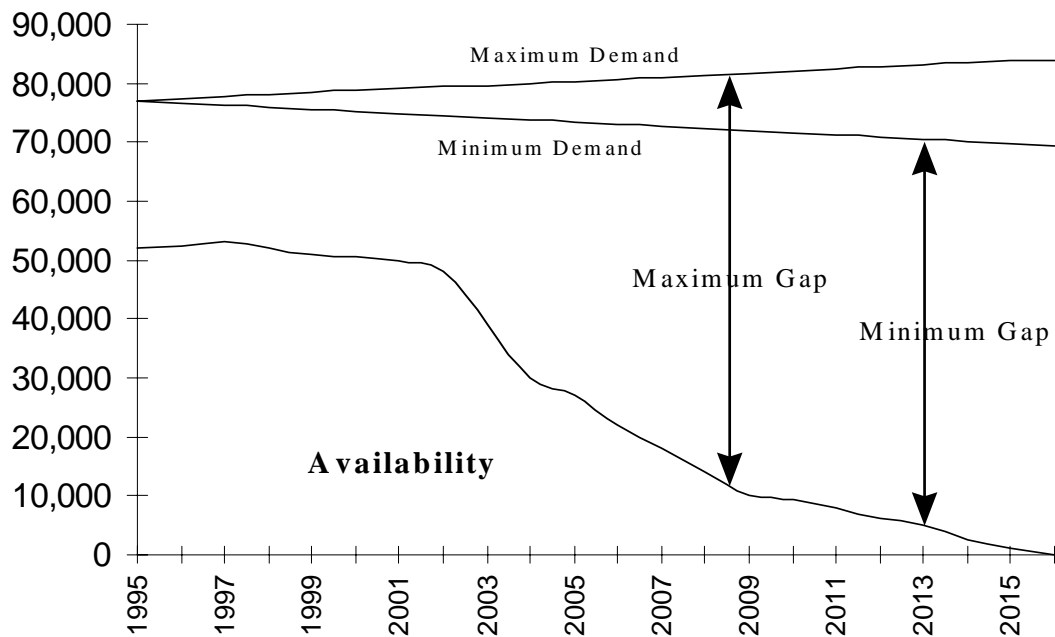


Figure 6



match mission demand, and this gap will grow to over 500K combined surface and air hours annually as Deepwater assets reach the end of their service lives while mission demand continues to grow.

The Deepwater Mission Analysis has indicated that some new resource capabilities will be required in order to manage tomorrow's missions more effectively. In keeping with the Department of Transportation's Strategic Goal 3, we must look to improvements in technology to provide for substantial savings in life cycle costs. Improvements in Command, Control, Communications, Computers and Intelligence (C4I), asset speed, target classification abilities, and boarding team dispatch capabilities will lead to improved operations utilizing fewer assets. Advances in maintenance systems should result in a lessening of adverse impact on the environment, higher operational hours per asset, and savings in the number of personnel required to perform maintenance tasks.

An attribute essential to the future success of the Coast Guard's Deepwater fleet is flexibility in its individual components. Throughout its proud history the Coast Guard has utilized all of its Deepwater assets for almost all Deepwater missions. This versatility has resulted in economy for the taxpayer as well as a remarkable operational efficiency. Deepwater assets can work independently--and do quite frequently--and they can work in concert with other assets. Multi-unit operations can vary from the simple ship-helo combination, to the Task Unit organization where a variety of ships and aircraft operate over a broad geographical area, to operating in a full Cooperative Engagement Capability environment with Navy, Marine Corps, and Allied forces. Our future assets must continue to shift rapidly from planned routine operations to unscheduled emergencies requiring vastly different capabilities. These transitions, so frequent in Coast Guard operations, can only be made by multi-mission assets crewed by well-trained, experienced professionals.

Included in this equation must be the ability to conduct surge operations. Surge operations are unscheduled responses to national emergencies which demand increased tempo and extraordinary efforts on the part of Coast Guard crews and resources. Figure 7 illustrates the effects of two recent surge operations. Response to these emergencies has long been part of the Coast Guard's experience, however recently such actions have become more frequent, almost to the point of becoming routine. Surge response is such an important Coast Guard responsibility that the *Commandant's Direction* states that a primary Service goal is to "Provide surge capability to meet national security and disaster response requirements". As mentioned previously, however, Coast Guard assets do not sit idle while waiting to respond to contingencies. They are fully employed conducting their "bread and butter" missions.

# CUTTER SURGE EFFORTS FOR ABLE VIGIL AND ABLE MANNER

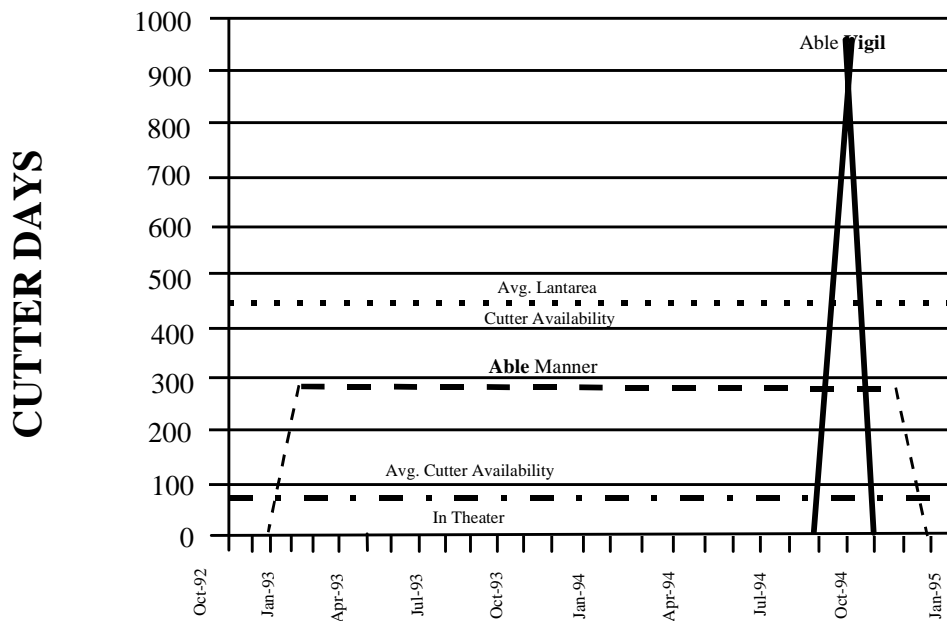


Figure 7

This graph compares two recent surge operations-- Able Manner, a sustained, high temp effort, and Able Vigil, a brief, but highly intense contingency.

Both operations required far more assets than are normally available within the Caribbean/Windward Passage theater of operations, in fact Able Vigil actually required more than the number of assets that normally operate within the entire Atlantic Fleet area of responsibility.

### **c. Proposed Alternatives.**

The *Deepwater Mission Analysis Report* considered non-material solutions to close the documented resource gaps. While certain efficiencies may be realized and will be explored, there is little to suggest that the Coast Guard can avoid acquisition to solve at least a portion of our resource dilemma. To date our mission analysis has indicated that while technology can certainly provide increased efficiencies, it will not eliminate the need for Coast Guard personnel to go To sea. We must be present where the action is--the Central Pacific, the deep Caribbean, the Atlantic fishing grounds, wherever our responsibilities demand--to enforce laws and regulations, deliver people and equipment, rescue and recover those in distress, and respond to environmental disasters.

The future points to even more Deepwater activity. Non-material enhancements and leveraging technology may allow us to do the job better with fewer major assets, but surface and air assets capable of maintaining a sustained high seas presence will remain an operational requirement.

A three-pronged approach will be employed to determine the most cost effective alternatives to filling the Coast Guard's Deepwater needs. Concept Exploration will concentrate on a combination of:

- o upgrading existing assets,
- o aligning with DOD--consideration of the use of existing or future DOD assets, and
- o non-developmental new acquisition of assets not otherwise available.

Various concepts of operation will be considered in the Concept Exploration phase, such as increased aerial surveillance by more cost effective means, and the employment of mother ships working with fleets of smaller patrol craft. The need for on scene sustainability will not go away, but it is probable that leveraging technology may allow us to gain this capability more economically.

New and innovative operating procedures which might increase the availability of our resources will be considered. Modern systems employed by various industry and government entities throughout the world indicate that increasing operational hours while maintaining personnel well-being, maintenance standards, and mission success is an achievable goal.

#### **d. Risks.**

Deepwater Capabilities project risks are uncertain and impossible to quantify at this point. The potential cost, schedule, and performance risks can be bounded approximately, however, by looking to sensitivity and scenario analyses of the risk sources, planned capability, and proposed alternatives. Possible risk sources include operations and maintenance policy, tempo and costs, acquisition costs, technology changes, design life, budget constraints, mission or program standard growth, threat advances and organizational biases.

**Cost.** As discussed above, technology will be leveraged to the maximum extent to decrease life cycle costs while increasing operational efficiency. Since higher initial costs could prove to be an investment toward lower operating costs, system Life Cycle cost, rather than Acquisition cost, will serve as the figure of merit for cost effectiveness and trade-off studies. Advances in automation technology, systems reliability, and energy efficiency leads to the assumption that the risk of not reducing life cycle cost is low.

**Schedule.** Schedule risk is based on failing to provide replacement capability before current assets failing. Assuming project initiation in FY 96--and given the Coast Guard's historic ability to keep assets in service beyond design life at much increased expense--this risk is moderate.

**Performance.** The multi-mission, multi-platform capability requirements make performance risk diverse and impossible to capture in one measurement. It is reasonable to assume that recent substantial advances in ship and aircraft technical capabilities, especially in C4I, will equate to increases in performance of new assets and the easing of our availability concerns. This indicates that overall performance risk is moderate.

#### **e. Acquisition Strategy Objectives.**

The objective of the Deepwater acquisition strategy is to meet Coast Guard and National Security mission requirements safely with cost effective resources that can be employed in a timely manner. Expected budgetary constraints require us to support the Deepwater mission functional requirements through a *complementary system of assets that can be operated with fewer personnel and significantly lower life cycle costs, without compromising overall performance.*

The goal of this effort is not to replace ships, aircraft, and sensors with more ships, aircraft, and sensors, but to provide the Coast Guard with the functional capabilities required to achieve mission success safely. Although some traditional assets will undoubtedly result from Concept Exploration, the system mix

could also include some very nontraditional tools. It is critical that the Deepwater system be viewed in its totality in order to develop a unified, strategic overview, ensure asset comparability and interoperability, and provide the most affordable solution for the taxpayer.

Once the Concept Exploration phase has determined the appropriate service force mix, the Deepwater Capabilities project will most likely separate into more manageable acquisition projects. These will likely include a variety of surface and air platforms, plus essential mission equipment and sensors.

**THE CHALLENGE** will be to exploit current and emerging technology to identify non-developmental type systems, subsystems, or equipment that may satisfy our Deepwater requirements and are potentially cost-effective. Market analyses, surveys, and feasibility studies will be conducted to identify reasonable Deepwater alternatives for further investigation and possible development. System safety concepts will be employed early in the life of the project in order to minimize or eliminate safety and health risks.

**INNOVATIONS** such as Modularity or space/weight reservation techniques may be utilized in order to obtain assets economically while retaining the flexibility required to respond to surge, national defense, and uncertain future tasking.

**LIFE CYCLE COSTS** must be reduced. Reduced or Minimal crewing will be investigated as a means to keep resource costs down, but we cannot allow the effort to economize to take priority over mission success. We must ensure that we retain the right number of personnel to get the job done without sacrificing either the mission or the well-being of our crews.

**THE ENVIRONMENT** will be considered in support of the Department of Transportation Strategic Goal 5. Public concerns with the environment demand that our new or updated assets be environmentally friendly. Environmental concerns will be a priority when choosing propulsion systems, but careful planning will also be given to maintenance requirements and materials, trash handling systems, hazardous waste production and disposal, and general consumption of resources by systems and personnel. Unfortunately, retrofitting yesterday's assets to conform to tomorrow's regulations may very well prove unaffordable or infusible, thus precluding the upgrading of some of our present assets.

### **3. Impact of Disapproving the Acquisition.**

#### **a. Existing Capability and Resources.**

The Coast Guard's Deepwater missions are the essence of the Service, yet our cutters and aircraft are aging fast and are barely adequate to perform today's missions. When these assets begin to reach the ends of their service lives in a few short years, as mission demands continue to increase, the resource gap will quickly become overwhelming. Without a major replacement effort, the Coast Guard will be unable to fulfill its crucial Deepwater obligations.

The Coast Guard cannot possibly maintain the status quo with respect to the condition of our major assets. Ships and aircraft are complex systems which require tremendous amounts of manpower-intensive maintenance and repair. Engineers view the maintenance life of a major asset in terms of the wear-in, sustainment, and wear-out phases. As ships or aircraft enter the wear-out phase, maintenance and repair costs often rise dramatically due to supportability and deterioration associated with age. There is a point of diminishing economy in continuing to operate and support aging ships and aircraft, especially when these older assets may not meet the functional requirements for the missions they support. Refer to Figure 8.

The aging of the Deepwater fleet may not seem cause for public concern. If the issue is not addressed, initially the Coast Guard will merely experience seemingly insignificant decreases in mission effectiveness. Failure to exploit new technologies will cause us to fall farther behind and will deny us potential economies in reduced crewing and enhanced asset availability. As our assets become obsolete and maintenance miracles fail to delay the inevitable any further, we will reach a point where major responsibilities will have to be abdicated. The impact will begin to manifest itself in our inability to conduct our proactive missions fully, and will slowly escalate to an inability to provide sufficient resources to our reactive missions such as search and rescue, response to environmental disasters, and response to mass migration attempts. The Coast Guard will lose the flexibility and speed of response that has become the hallmark of our organization. No one else is available to fill this void and carry out these national priorities. The Coast Guard must retain the capabilities required to carry out its vital functions.

#### **b. Constraints.**

**Life Cycle Costs.** The acquisition strategy must minimize the cost of Deepwater asset ownership. Each alternative must minimize crewing and operating costs. The assets must leverage the use of off the shelf components and logistics support. The support concept must minimize down time and organizational level maintenance and repair.

# RELATIONSHIP BETWEEN USAGE TIME AND FAILURE RATE

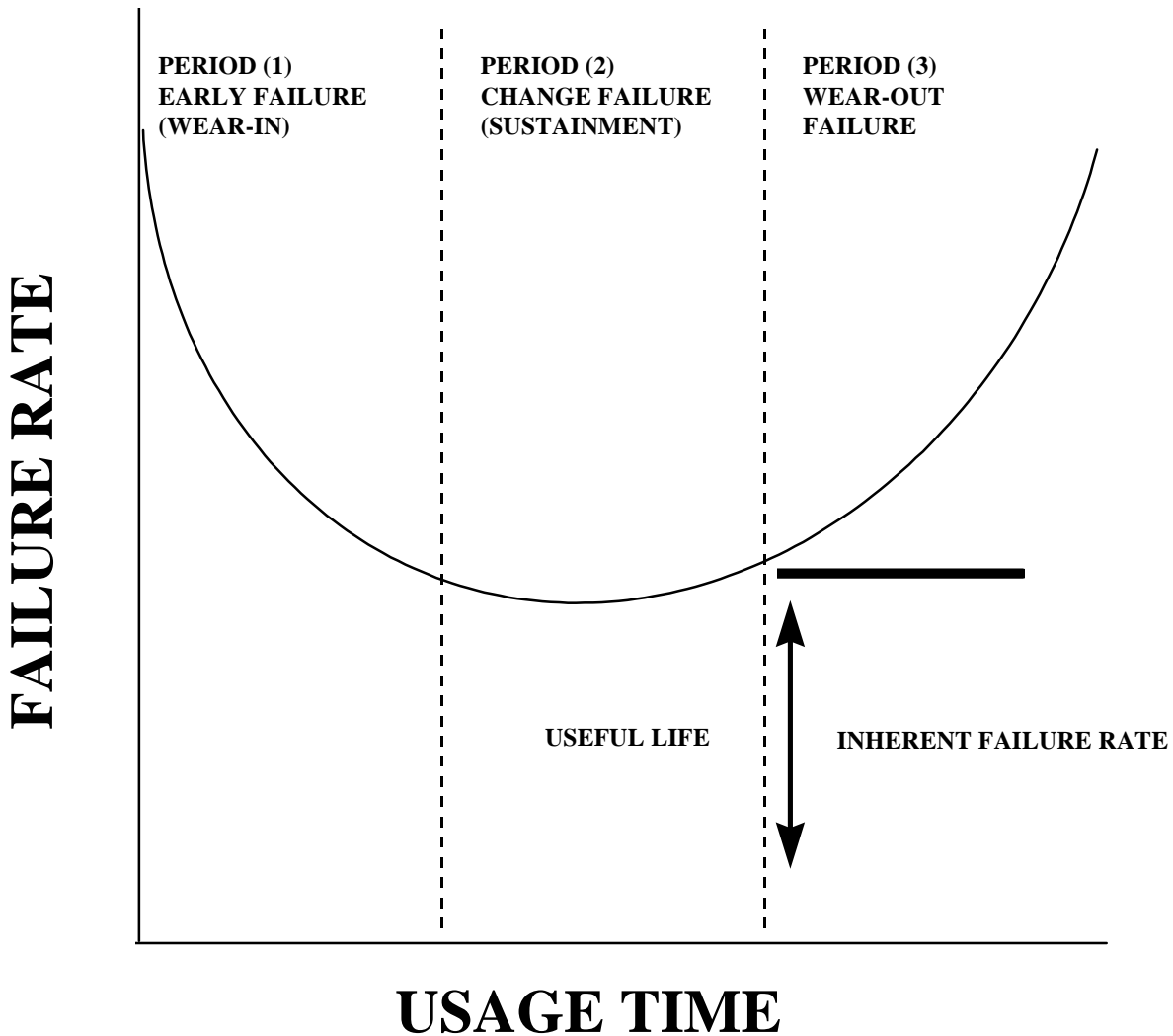


Figure 8

This graph represents the generic maintenance cycle of mechanical equipment. As mechanical equipment ages, the frequency of failure increases and thus the cost of maintaining that equipment rises.

**Affordability.** The acquisition strategy must incorporate a phased approach to replacing Deepwater capabilities to ensure that project elements are affordable within a reasonable appropriations stream, with the realization that the trend of future funding is a continuing decline.

**Schedule.** The acquisition strategy must be streamlined to ensure that capable assets begin to enter the Coast Guard inventory in the 2002-2005 timeframe.

### **C. Potential Opportunities.**

Replacing the Coast Guard's Deepwater capabilities should offer the opportunity to realize considerable savings. Technological enhancements, particularly those advocated earlier in this document--better C4I and classification, increased speed, and enhanced boarding capability--should result in increased performance. Acquiring state of the art assets should reduce life cycle costs by allowing savings through significant reductions in crew sizes, increased availability of individual assets, reductions in costs for maintenance and environmental compliance, and the ability to exploit other agencies' assets.

## **4. Resources Required.**

### **a. Total Acquisition Costs.**

The preliminary Total Acquisition Cost estimate for the Deepwater Capabilities project could reach \$7.25-15.00, in FY 98 dollars, excluding recurring operating and maintenance costs. This is a gross estimate based on total, one-for-one replacement of the present fleet, including all major cutters (WHEC, WMEC, mature class), 110' WPBs, HC-130s, and HU-25s, along with the necessary sensor packages. The estimate does not factor in economies that most certainly will be realized by leveraging technology to reduce the number and/or complexity of assets required. A much more complete Total Acquisition Cost estimate will be made at KDP-2 after Concept Exploration studies point more accurately towards the types and numbers of Deepwater assets that will be required.

### **b. Timing.**

Deepwater assets are beginning to reach the end of their service lives now, and the majority of them will reach this point within the next decade. In order to ensure that the Coast Guard can continue to perform its vital Deepwater functions without interruption or degradation, the Initial Operational Capability (IOC) date for replacing present Deepwater capabilities should be 2002 to 2005. If the IOC is delayed beyond this timeframe, maintaining our present aging assets becomes increasingly inefficient and cost prohibitive.



### **c. Priority/Affordability.**

Replacing our present Deepwater capabilities is the Coast Guard's highest priority for the early 21<sup>st</sup> Century. From the purchase of our first ten cutters in 1790, the Coast Guard has been a Deepwater service, national interests and the statutory authorities governing Coast Guard missions clearly provide the severely impact the prosecution of all Coast Guard missions, Coastal Zone as well as Deepwater, since the Deepwater fleet is the repository of the highest level of Coast Guard expertise and capability. Gross estimates for replacing the Deepwater assets realities of constraining budgets must be balanced against the imperative to provide the required level of service to the public. The acquisition strategy will incorporate a phased approach to replacing Deepwater capabilities to ensure the project elements are affordable within AC&I appropriations.

### **d. Other Government Agencies.**

A close relationship with DOD is essential to this project in order to benefit from research and design efforts performed by DOD, particularly those involved with the Surface Combatant 21<sup>st</sup> Century (SC-21) project, to ensure interoperability and compatibility, to enhance the probability of realizing economies, and to avoid acquiring redundant capabilities. An ongoing study of the desired defense capabilities of future cutters, performed by the Center for Naval Analyses, is the first phase of this relationship.

Although no other federal agencies have capabilities similar to those which the Coast Guard must replace, future operations with agencies such as FEMA, Customs, DEA, NOAA, and INS will certainly be considered to ensure that our ability to interact with such organizations is maximized.

## **5. Recommendations.**

- a. Approve the Deepwater Capabilities project mission need statement.
- b. Designate the Deepwater Capabilities project as a Level I major acquisition.
- c. Grant authority to proceed with the Concept Exploration Phase.

PROPOSED CONCEPT EXPLORATION PHASE EXIT CRITERIA FOR THE  
DEEPWATER PROJECT

1. Overall concept defined.
2. Project spin-offs and levels proposed.
3. Preliminary Operational Requirements Documents (PORDs)/  
Operational Requirements Documents (ORDs) developed for each  
project.
4. Acquisition Plans (APs) defined for each project.
5. Acquisition Project Baselines (APBs) defined for each project.
6. Independent Operational Test and Evaluation Advisors (IOTEAs)  
identified as needed.

Resource Impact Assessment  
for the  
Deepwater Capability Replacement Project  
Key Decision Point #1

|                        |                |   |
|------------------------|----------------|---|
| Prepared/Submitted by: | <u>5/13/96</u> | _____<br>G-A Reviewer                         |
| Endorsed by:           | <u>5/16/96</u> | _____<br>Chief, Office of<br>Programs (G-CPA) |
| Endorsed by:           | <u>5/17/96</u> | _____<br>Director of<br>Resources (G-RC)      |

## **RESOURCE IMPACT ASSESSMENT**

### **DEEPWATER CAPABILITY REPLACEMENT PROJECT**

#### **KEY DECISION POINT #1**

##### **DEEPWATER LIFE CYCLE COSTS**

The life cycle cost of an acquisition is the key factor in determining its impact on Coast Guard resources. Total Deepwater life cycle costs have not yet been determined at this initial stage of the project. Resource Impact Assessments for future Key Decision Points (KDP) will contain more complete life cycle cost information as it becomes available. The components of life cycle cost are acquisition (AC&I) costs and operating expenses (OE) costs. These components are discussed below.

##### **o DEEPWATER ACQUISITION COSTS**

Resource requirements for the Deepwater acquisition, based on replacement in kind of existing assets, are estimated to be \$7.25 - \$15.0 billion in constant FY 1998 dollars. This figure is an estimate based on total, in-kind replacement of the present fleet, including all major cutters and aircraft (378' HEC, 270' MEC, 210' MEC, 110' WPB, HH-65, HH-60, HC-130, HU-25). The Coast Guard intends to leverage technology to lower the number of existing assets that need to be replaced. Deepwater funding requirements are included in the Long Range Resource Allocation Plan (LRRAP), contained in the Coast Guard's FY 1998 Capital Investment Plan. An official government cost estimate will be performed as soon as practicable, as the project progresses with concept exploration and the types and numbers of Deepwater assets are determined. The first funding for the Deepwater acquisition will appear in the FY 1998 budget request.

##### **o DEEPWATER OPERATING EXPENSES COSTS**

Operating expenses costs are the largest and most significant part of an acquisition's life cycle cost. Deepwater OE costs are unknown at this time. However, there are currently operating and maintenance funds in the base for the existing fleets that should at least approximate the costs for the replacement fleets. As the project progresses to KDP-2 and the asset mix is determined, the projected operating expenses costs will be refined.

## OVERALL RESOURCE IMPACT

AC&I: This project is the largest recapitalization effort the Coast Guard will face in the next several decades. The existing AC&I baseline funding target, which has steadily eroded from an average appropriation of \$680M throughout the 1980's to a baseline of \$439M in FY95, \$428M in FY97 and \$362M in FY98, will be severely constrained to support this acquisition along with other Coast Guard recapitalization needs. Steady state recapitalization of the Coast Guard's \$19B asset base requires \$677M per year (recently updated to reflect existing assets and expressed in constant 1996 dollars).

The Coast Guard intends to take an active part in enhancing affordability of the Deepwater project in as many ways as possible, including leveraging technology to reduce the number of replacement assets needed, structuring the acquisition in phases, and adhering to the principles of good project management. However, AC&I requirements (including the Deepwater project) will still substantially exceed funding levels indicated in the Administration's current baseline targets and recent Congressional appropriations. Therefore, the Administration and Congress must make a commitment to support the level of funding required to recapitalize the Coast Guard's Deepwater assets. These platforms provide the Nation with the Deepwater capability that has proved so essential, especially during crises such as the Haiti/Cuba alien migrant interdiction operations, the Cuban shootdown of U.S. civilian aircraft, protection of depleted fisheries resources, drug law enforcement interdiction, and oil spill response. Without adequate acquisition funding support, the Coast Guard will not look the same as it does today, and its ability to provide these vital services will be curtailed.

OE: The impact of the Deepwater project on the OE base is unknown at this time. The existing base could be reduced to the extent that new technologies and new maintenance practices are leveraged to substantially reduce fleet and crew sizes and system support costs. Although the acquisition cost will be substantial in AC&I dollars, long term savings may be achievable in the recurring OE base.